Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 101 of the Commission's	)	
Rules to Facilitate the Use of Microwave for	)	WT Docket No. 10-153
Wireless Backhaul and Other Uses and to Provide	)	
Additional Flexibility to Broadcast Auxiliary	)	
Service and Operational Fixed Microwave	)	
Licensees	)	
	)	

COMMENTS OF CERAGON

Ceragon Networks, Ltd.[1] hereby respectively submits comments in response to the above captioned Notice of Proposed Rulemaking and Notice of Inquiry.

Introduction

Ceragon supports the Commission's goal of addressing the looming spectrum shortage for point-to-point microwave wireless networks. We believe that some of the proposed rule changes will benefit current and future operators, but also have concerns that some rule changes will have an adverse effect. In general, we support the concept of spectrum sharing in bands utilized by

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[1] Ceragon Networks Ltd. (NASDAQ/TASE: CRNT) is a leading provider of high-capacity LTE-ready wireless backhaul solutions for cellular and fixed wireless operators, enterprises and government organizations. Ceragon's FibeAir® product family offers scalable solutions for wireless transport of broadband services. Operating across multiple frequencies for IP and SONET/SDH protocols, FibeAir systems support the emerging needs of next-generation networks that are evolving to all-IP based services. Ceragon leads the market in IP backhaul, offering a unique, native IP solution that provides the efficient, robust connectivity required for LTE, WiMAX and converged networks. More information is available at www.ceragon.com.

systems of like service (i.e. Fixed Service [FS]) and believe FS systems are capable of sharing the 6875-7125 MHz and 12.7-13.2 GHz bands. We also hope that progress is made towards sharing in other bands within which FS systems operate such as the 7125-8500 MHz band [2] . Ceragon supports the elimination of the 'Final Link' rule and acknowledge broadcasters face the same spectrum shortages experienced by operators in the Part 101 bands. Ceragon supports the Commission's proposal for allowing use of Adaptive Modulation, which will enhance the propagation reliability of wireless links. Ceragon strongly opposes Auxiliary Stations for a variety of technical and commercial reasons detailed in our comments below. Finally, we are pleased to offer comments related to the NOI covering relaxed spectrum efficiency standards in rural areas, relaxing Part 101 antenna standards, and we offer a suggestion that we believe would result in the increased use of the 10.55-10.68 GHz band

Making Additional Spectrum Available for Part 101 FS Operations

Ceragon supports the proposal to allow spectrum sharing between Part 74 BAS and Part 78 CARS operations with Part 101 FS operating in the 6875-7125 MHz and 12.7-13.2 GHz bands. We believe that successful sharing in these bands is possible provided all operators conduct prior frequency coordination in accordance with Part 101.103. This includes mobile (temporary fixed) and TV Pickup links. Failure to include these types of nomadic radio links will prevent Part 101 FS operators from using the bands due to potential interference and the negative impact on the reliability of their network. If prior coordination of mobile links is not possible, then we believe the bands must be segmented and allocated to FS and mobile applications to keep the services

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[2] See RM-11605 Fixed Wireless Communications Coalition, Amendment of Parts 2 and 101 of the Commission's Rules to Provide for Federal and Non-Federal Sharing in the 7125-8500 MHz Band

separate. We believe that the higher demand for greater capacities and larger channel bandwidths results in a lower demand for channel bandwidths less than 10 MHz. Creating channel plans that include bandwidths as small as 400 kHz and overlapping them with the channel plans currently used for CARS and BAS microwave links complicates the frequency selection process and results in inefficient use of the spectrum. Efficient use of the spectrum is maximized when all users adhere to a common channel plan. As operators in the BAS and CARS bands migrate to digital networks, it is recommended that users in these bands migrate to the channel plans proposed in this NPRM. Finally, it is our opinion that the low demand for narrowband channels does not warrant including channel plans with bandwidths less than 5 MHz.

Elimination of the "Final Link" Rule

Ceragon does not oppose elimination of the 'Final Link' rule in consideration of the growing shortage of spectrum in all FS bands. We believe elimination of the rule will not have an adverse effect on Part 101 licensees provided the microwave links used for BAS and CARS are digital-based systems that adhere to the same rules governing Part 101 FS microwave links including frequency tolerance [3], maximum EIRP limitation [4], antenna standards [5], capacity and loading requirements [6], and minimum path length [7]. Furthermore, to ensure that capacity and loading

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[3] See 47 C.F.R. § 101.107(a).

[4] See 47 C.F.R. § 101.113(a).

[5] See 47 C.F.R. §101.115(b)(2).

[6] See 47 C.F.R. §101.141(a)(3).

[7] See 47 C.F.R. §101.143.

requirements are met, rule 101.141(a)(5), which exempts transmitters that carry video traffic from complying with 101.141(a)(2) and (a)(3), should be eliminated. We also believe that rule 101.603(b)(3) should be retained.

Adaptive Modulation

Ceragon supports the use of Adaptive Modulation as a means of enhancing the reliability of a microwave link during periods of deep fading. At issue is when a link operates at lower and lower modulation rates during faded conditions, the spectrum efficiency rule of 101.141 may be violated. Ceragon would like to emphasize that current radios employing Adaptive Modulation meet the spectrum efficiency rule using modulation rates as low as QPSK for microwave links operating in frequency bands higher than 11 GHz. Specifically, the 1 bit/second/Hertz rule specified in 101.141(a)(1) is met using modulation rates as low as QPSK in frequency bands higher than 11 GHz. Only in Part 101 bands 11 GHz and below does there exist the potential for the spectrum efficiency rule of 101.141(a)(3) to be violated. Hence, we support rulings that avoid unique design and operation requirements of radio equipment depending on whether a microwave link operates in a frequency band above 11 GHz or at 11 GHz and below. Such rulings would result in the creation of multiple lines of a single product-line, thus driving up equipment development and production costs to the user.

We disagree with those commenters that believe operators will use Adaptive Modulation in conjunction with under-designing a microwave link. We believe that operators of microwave links will continue to engineer radio paths that meet high reliability requirements and will use

Adaptive Modulation as a means to aid the survivability of critical traffic across a microwave link during periods of deep fading. This type of fading will occur during rain-induced fading on microwave links operating above 10 GHz, and during ducting episodes on long paths in certain climates operating in the 6 to 8 GHz bands. In both cases, the number and severity of rain and ducting events vary from one geo-climate region to another, and vary from one year to the next.

We do not believe logging Adaptive Modulation activity would prove useful, assuming such activity would have to be stored within the radio, because 1) adding the capability to capture and store such information within the radio drives up the development and production costs of radio equipment, 2) violation of 101.141 only applies to microwave links operating in bands up to 11 GHz, and does not apply to Part 101 FS microwave links operating above 11 GHz, and 3) Adaptive Modulation activity will vary year to year depending on whether a region is experiencing drought, normal, or wet conditions, thereby rendering the logged data unreliable due to its variability and year-to-year inconsistency and therefore could not be used for enforcement.

We agree with the Commission's use of the term 'anomalous signal fading', provided the term includes normal rainfall events.

We believe the rules should require licensees that use Adaptive Modulation to 1) license a transmitter using the highest modulation rate that will be used, 2) the authorized bandwidth shall not be exceeded during periods when Adaptive Modulation reduces the modulation rate, and 3) the spectrum efficiency rule of 101.141(a)(1) shall not be violated.

Auxiliary Stations

Ceragon strongly opposes Auxiliary Stations and does not think the Commission should allow operation of a FS transmitter in the manner described by WSI or in the NPRM. We believe the proposal will adversely affect spectrum usage, as well as undermine investments made by commercial operators that have acquired spectrum through the auction process.

The entire premise of WSI's proposal is based on their claim that a region exists around a transmitting station within which no other transmit/receive facility can operate, and that this region represents wasted and inefficient use of the frequency spectrum. Even the Commission describes the keyhole-shaped pattern of a transmitting facility as 'preclusive' to sharing the same spectrum with other operators[8]. Yet this claim is inaccurate and therefore the entire argument becomes invalid. Evidence of the inaccuracy of this claim is based on the existence of hundreds, if not thousands of transmit facilities operating as multi-way junction sites using frequencies that are not only adjacent to one another, but are even co-channel. High performance and ultra-high performance antennas provide sufficient front-to-back ratio and side-lobe suppression to allow microwave links operating in the near vicinity of each other, as well as co-located on the same tower, to operate on a co-channel basis, thus achieving 100% frequency reuse thereby maximizing use of the frequency spectrum. A database search of the Lower 6 GHz band yielded more than 1400 call signs where multi-way junction sites are transmitting on co-channel frequencies. A sample of these call signs is included in Table A. Similar instances of co-channel

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[8] NPRM at ¶ 51.

operation would be found in other frequency bands. The existence of these stations with multiple microwave links operating co-channel clearly contradicts WSI's assertion of an exclusion zone surrounding transmit facilities and invalidates their claim that traditional point-to-point microwave links inherently waste or use the frequency spectrum inefficiently.

It is possible for microwave links that originate from a common transmit site to operate on a co-channel basis because each link uses transmit powers that are equal or nearly equal, and the length of the paths are comparable. It is not by chance that this happens. FCC Rules assure the compatibility of microwave links by establishing standards for limitations on transmit power [9] and minimum path lengths [10]. Current rules assure efficient and effective use of the frequency spectrum and licensees who comply with the rules enjoy equal access and maximized use of Part 101 bands. Ironically it is the WSI proposal that is preclusive in nature due to the practice of licensing a transmit facility using the maximum EIRP value allowed by FCC Rules [11]. A search of the ULS database of licensed EIRP levels in the Lower 6 GHz band yielded data from which the figure below was produced. Whereas the average EIRP of licensed microwave links is approximately 68 dBm, it is WSI's practice to license their transmit facilities near the maximum allowed EIRP of 85 dBm [12]. The practice of arbitrarily licensing an EIRP near 85 dBm maximizes the geographical coverage of the keyhole shape within which WSI proposes to deploy

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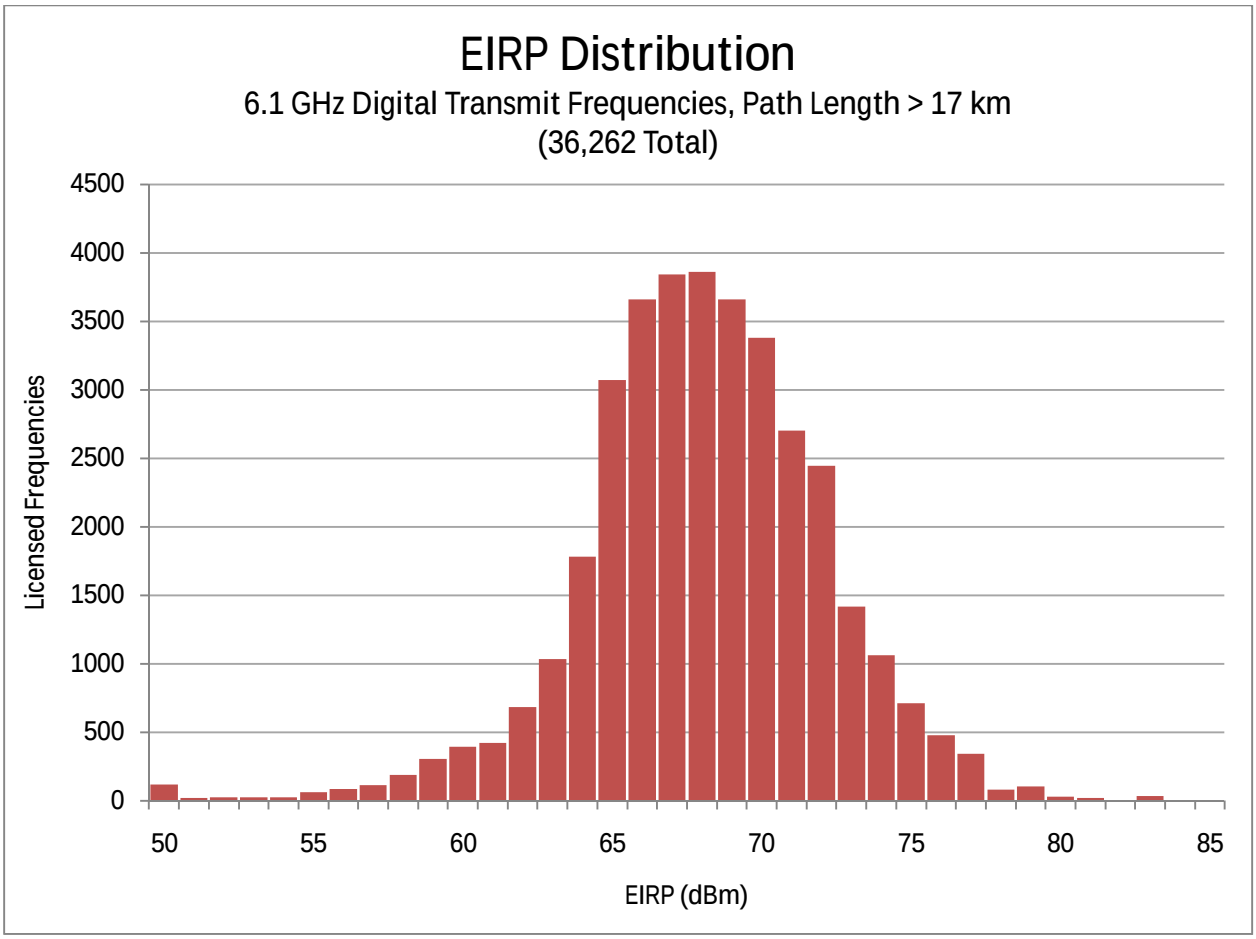
[9] See 47 C.F.R. § 101.113(a).

[10] See 47 C.F.R. § 101.143.

[11] See 47 C.F.R. § 101.113(a).

[12] See formerly licensed facility WQGH696, Paths 1 through 3 licensed with an EIRP of 84.7 dBm.



its Auxiliary (multipoint) Stations, but at the same time it creates an exclusion region wherein no other microwave link or transmit/receive facility can be coordinated on a co-channel and even adjacent channel basis. The following two simplified calculations illustrate how (A) two traditional microwave links may operate co-channel from the same site using an ultra-high performance antenna, and (B) how a WSI facility excludes other traditional microwave links from operation on both a co-channel and adjacent channel basis.

Illustrative Calculation

1. Two paths, each 12 miles in length, operate in the 6.2 GHz band from a common site.
2. Both links use 64-QAM radio equipment and a 30 MHz channel bandwidth.
3. A typical co-channel T/I objective is 30 dB, and -8 dB for adjacent channel.

4. Based on a receiver threshold of -72 dBm, the allowable interference levels are -102 dBm and -64 dBm for co-channel and adjacent channel, respectively.
5. All antennas are 6-ft in diameter, and one of the antennas at the common site is an ultra-high performance antenna, with a front-to-back ration of 75 dB. All antenna gains are 38.8 dBi.

A) Calculation between two traditional microwave links, each with an EIRP of 68 dBm

Normal RSL = EIRP – Free Space Loss + Receive Antenna Gain

Normal RSL = 68 dBm – 134.0 dB + 38.8 dBi

Normal RSL = -27.2

Interference Level = EIRP – Free Space Loss + Receive Antenna Gain – Antenna Discrimination Loss

Interference Level = 68 dBm – 134.0 dB + 38.8 dBi – 75 dB

Interference Level = -102.2 dBm, which is below the objective of -102 dBm, thus allowing co-channel operation, and achieving 100% frequency reuse.

B) Calculation between a traditional microwave link with an EIRP of 68 dBm, and a WSI link with an EIRP of 84.7 dBm. Only interference into the traditional microwave link need be considered.

Normal RSL = EIRP – Free Space Loss + Receive Antenna Gain

Normal RSL = 68 dBm – 134.0 dB + 38.8 dBi

Normal RSL = -27.2

Interference Level = EIRP – Free Space Loss + Receive Antenna Gain – Antenna Discrimination Loss

Interference Level = 84.7 dBm – 134.0 dB + 38.8 dBi – 75 dB

Interference Level = -85.5 dBm, which is higher than the co-channel objective of -102 dBm, thus eliminating the possibility of co-channel operation.

> Furthermore, there is only a 21.5 dB margin between the Interference Level of -85.5 dBm, and the adjacent channel interference level objective of -64 dBm. Hence, adjacent channel operation is prevented for antenna discrimination values of 53.5 dB or less, which for a 6-ft ultra-high performance antenna occurs at an angular offset of about 35-degrees off main beam. Therefore, adjacent channel operation is prevented for traditional microwave paths that are oriented 35-degrees or less off the main beam of the WSI link.

The above simplified calculations illustrate how the aforementioned 1400+ multi-way junction sites licensed and operating in the Lower 6 GHz band are able to maximum use of the frequency spectrum by operating on co-channel frequencies at co-located sites. Furthermore, the calculations illustrate how WSI's practice of licensing a transmitter using the maximum allowed EIRP results in minimizing use of the frequency spectrum by preventing not only co-channel operation between its facilities and traditional microwave links, but also adjacent channel operation in certain cases. Traditional microwave links are able to operate co-channel at a common location thus achieving 100% frequency reuse. At a site shared with or near a WSI transmit facility, since co-channel and in some cases adjacent channel operation is prevented; only 5 of the 8 channel pairs in the Lower 6 GHz band may be useable, thus rending frequency reuse as low as 62%.

We believe the WSI practice of arbitrarily licensing transmitters with EIRP levels near the maximum allowed EIRP violates Part 101.113(a), which requires licensees to operate using the minimum transmit power necessary. More importantly, a consequence of allowing a WSI

transmitter to license the maximum allowed EIRP is a vast waste of frequency spectrum due to the preclusive nature of its implementation.

Ceragon would like to bring to the Commission's attention the incompatibility between WSI's Time Division Duplex (TDD) operation and Frequency Division Duplex (FDD) employed by traditional microwave links. Mixing TDD and FDD links will result in wasted frequency spectrum. Each channel plan authorized by the Commission and included in Part 101 [13] is divided into a low band and a high band, in which each transmit frequency has a corresponding (return) receive frequency. Frequency planners successfully maximize reuse of the frequency spectrum by assigning transmit frequencies to FDD links that originate at a common site from one half of the channel plan or the other. This practice assures non-interference between local transmitters and receivers by maintaining frequency separation afforded by the channel plan itself. However, since TDD links transmit and receive from the same half of the band, there can exist insufficient frequency separation between local transmitters of a WSI facility and receivers of a traditional licensee resulting in unacceptable interference levels. The paths of interference exist through direct close coupling between the antennas on the same tower or via reflections from nearby structures. When two FDD links at a site do not share the same scheme of which half of the channel plan they transmit from, the site is referred to as a 'bucking station' and referred to as violating the high/low plan. Every effort is made by FDD frequency planners to avoid bucking stations due to consequences that include interference due to reflections and wasted

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[13] See 47 C.F.R. § 101.147.

frequency spectrum [14]. Since TDD systems do not adhere to the high/low structure of the Part 101 channel plans, they inherently create bucking stations when mixed with FDD stations. Bucking station situations are normally resolved by maintaining as many as two vacant channels between frequencies used by the microwave links involved. The obvious consequence of this resolution is wasted frequency spectrum, which reduces frequency reuse at nearby sites where a TDD and FDD transmitter operate to 5 of the 8 possible channel pairs, or 62%.

We believe that all point-to-point microwave links, including those linking to auxiliary stations, should adhere to Part 101 rules, which includes those related to antenna standards [15], capacity and loading requirements [16], minimum path length [17], prior coordination [18], and acquisition of a call sign that authorizes each auxiliary station to transmit. Failure to do so would eliminate the security associated with operating in a licensed band and reduces the Part 101 band to the same status as an unlicensed band. We disagree with the proposal in the NPRM to exempt auxiliary stations from these requirements since doing so would demonstrate a bias favoring one type of wireless service over another. Furthermore, the rules related to antenna standards, capacity and loading requirements, minimum path length, and prior coordination are well crafted and have been key to the successful use of the Part 101 bands and have directly contributed to maximizing use of the spectrum while assuring equal access to all licensees.

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[14] See NSMA Recommendation WG 14.87.011 Mixed High/Low Frequency Plans and Reflection Interference. http://www.nsma.org/

[15] See 47 C.F.R. §101.115(b)(2).

[16] See 47 C.F.R. §101.141(a)(3).

[17] See 47 C.F.R. §101.143.

[18] See 47 C.F.R. §101.103.

Ceragon agrees with the Commission in recognizing the point-to-multipoint nature of the WSI proposal [19], and that the point-to-multipoint service that WSI is proposing is better suited for operation in frequency bands that the FCC has already set aside for such services. We support the Commission's observation that the WSI point-to-multipoint service is better suited in the LMDS band, and we also point out the availability of the 2400-2483.5 MHz, and the 5725-5850 MHz bands, which are already being used for point-to-multipoint applications.

We see opportunity to support Auxiliary Stations based on the Commission's proposal to operate such Auxiliary Stations in the 38.6-40 GHz band. This band is well suited for deployment of Auxiliary Stations since the path lengths are short, and therefore better suited for operation in the higher frequency bands. Furthermore, since there is 1.4 GHz of spectrum allocated in the 38.6-40 GHz band, we think the band could be segmented with an amount allocated specifically for point-to-multipoint applications, and the remainder allotted to point-to-point applications. In doing so, there would be no need to compromise the existing Part 101 rules, and a new class of service could be established for point-to-multipoint Auxiliary Stations in the 38.6-40 GHz band.

We agree with the commenters mentioned in the NPRM [20] that the WSI proposal seeks to establish a geographical area within which it can operate Auxiliary Stations. However, the Commission states that it is the Auxiliary Stations that have the potential to establish the geographic area when in reality it is the practice of licensing the main link using the maximum

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[19] NPRM at ¶ 55.

[20] NPRM at ¶ 57.

EIRP that creates the maximum sized keyhole-shape discussed above. The WSI approach is to license the main transmitting site using the smallest diameter antenna with the most broad-beam antenna pattern allowed. When combined with the maximum EIRP, this establishes a geographic area that is as large as can be achieved. The multipoint Auxiliary Stations are then located within this geographic area. Clearly this practice increases the potential for interference into existing licensees, and has a preclusive effect on future licensees deploying traditional microwave links anywhere near the main link. We agree that the practice of licensing stations using the maximum EIRP violates Part 101.103(d)(1) by inhibiting the most effective and efficient use of the radio spectrum by its preclusive nature.[21]

Finally, we believe allowing point-to-multipoint deployments as proposed by WSI not only undermines the significant investment made by successful bidders that participated in spectrum auctions previously conducted by the FCC, but also could limit participation in future auctions. The proposed rule changes contained in the NPRM grants WSI exclusive rights to operate within a geographic area that has been established by licensing a transmit facility with the highest EIRP allowed, using an antenna with the poorest radiation characteristics allowed. We believe this practice sidesteps the auction process and grants those operating a WSI style multipoint system full rights to operate using frequency spectrum in a geographic area on an exclusive basis. Whereas successful auction bidders obtained such exclusive rights through the auction process and at great expense, allowing the type of operation that WSI proposes undermines their investment and will cause bidders to think twice about participating in future spectrum auctions.

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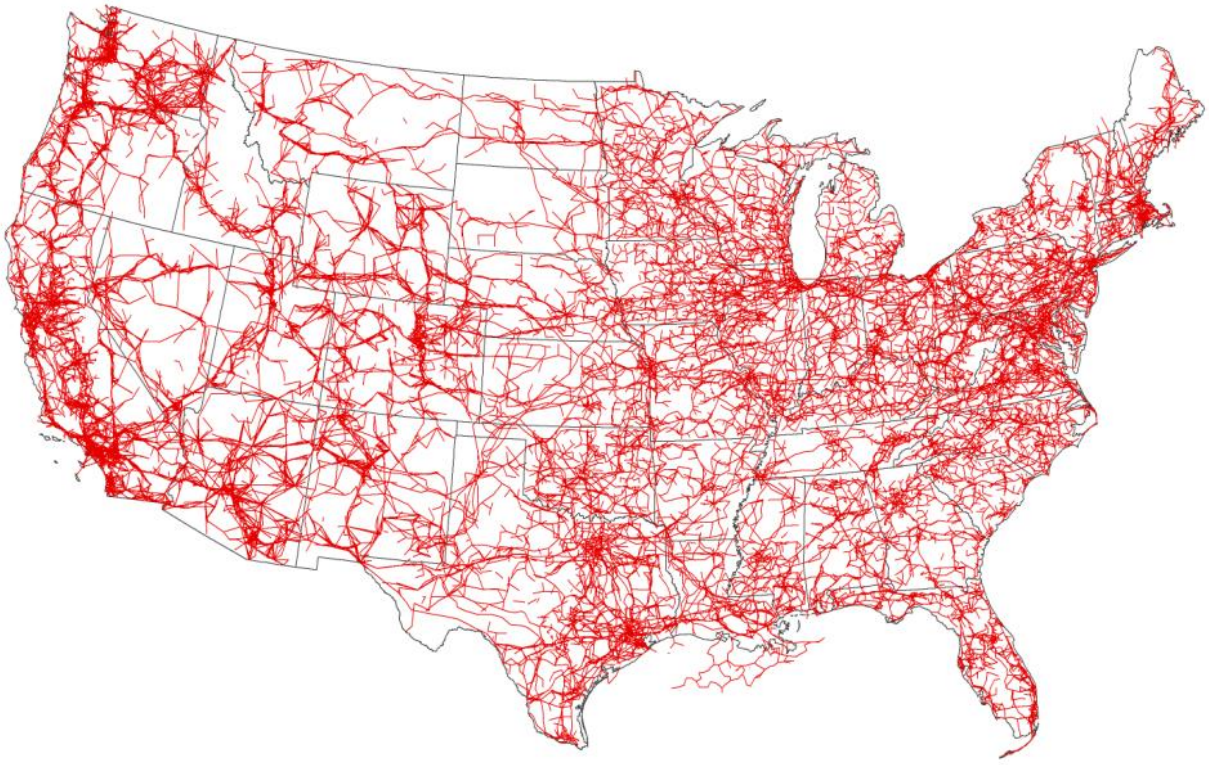
[21] NPRM at ¶ 57.

Modification of Efficiency Standards in Rural Areas

Ceragon does not support relaxing efficiency standards in rural areas. The graphic below illustrates how Lower 6 GHz backbone routes traverse the nation, passing through areas that we believe would be considered ‘rural’. We believe these links and all microwave links should adhere to current efficiency standards. Furthermore, with the ability to employ product features such as Adaptive Modulation, and the ability to operate at sub-compliant modulation rates during periods of anomalous propagation conditions as proposed in this NPRM, we believe that backhaul microwave links operating in rural areas can be deployed in a cost effective manner without compromising the existing spectrum efficiency rules.



Graphic by Comsearch, Inc.

Review of Part 101 Antenna Standards

Ceragon does not support a broad relaxation of antenna standards in Part 101 bands. At a time when available frequency spectrum is slowly becoming scare, we recommend that antenna standards remain as they are. To relax antenna standards or allow the use of antenna sizes smaller than what is currently allowed will result in antennas with inferior radiation characteristics to be deployed thereby raising the potential for interference and reducing the availability of frequency spectrum. The only band where we see an opportunity to relax an antenna standard is the 18.7 GHz band, where a 1-foot antenna could be allowed as a Class B antenna.

Increasing Flexibility Generally

Ceragon would like to suggest the addition of a 10 MHz channel plan in the 10.55-10.68 GHz band [22]. We think that the maximum channel bandwidth of 5 MHz limits the usability of this band and operators that want to use a 10 MHz channel on a short microwave link are forced into the 10.7-11.7 GHz band. We believe that the addition of a 10 MHz channel plan in the 10.55-10.68 GHz band would increase the usage of this band. We envision a 10 MHz channel plan that is consistent with the existing channel plans, which feature a 65 MHz transmit to receive separation.

(7) 10 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10560	10625
10570	10635
10580	10645
10590	10655
10600	10665
10610	10675

[22] See 47 C.F.R. §101.147(m)

Finally, Ceragon would like to reiterate its support of the FWCC proposal for band sharing in the 7125-8500 MHz band [23].

Summary

Ceragon supports the Commission's goal of addressing the growing spectrum shortage that faces operators in the Part 101 bands. For decades these bands have been used to carry critical commercial, private, and government communications that are vital to the nation. Whether the microwave links carry traffic necessary to maintain our power grids, support transportation services, ensure public safety, or provide personal communication needs, traditional point-to-point microwave links must be afforded the spectrum necessary to ensure growth capabilities while protecting the spectrum that is in use. We ask the Commission to consider carefully before enacting any rule that represents a major departure from the well crafted rules that have heretofore served the users of Part 101. We are most concerned about the probable, not to mention the unforeseen, consequences of allowing Auxiliary Stations and the type of point-to-multipoint service proposed by WSI within the Part 101 bands. We trust the Commission will respond in a cautious manner by abandoning the concept of such a service in the Part 101 bands, or by imposing strict limitations on EIRP, or by moving the service into a more appropriate frequency band, such as the 24 GHz or 38.6-40 GHz band.

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[23] See RM-11605 Fixed Wireless Communications Coalition, Amendment of Parts 2 and 101 of the Commission's Rules to Provide for Federal and Non-Federal Sharing in the 7125-8500 MHz Band

Respectfully submitted,

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October 25, 2010

TABLE A – Sample of Call Signs that operate on co-channel 6.2 GHz frequencies on multiple links demonstrating 100% frequency reuse, and contradicts the idea of a 'preclusive' effect of traditional microwave transmitters

KAC58	KIA30	KNV90	KTF32	WAH506	WAS461	WCU361	WHO236	WLA723	WLK741
KAC59	KIL49	KNZ42	KTF33	WAH507	WAS462	WCU386	WHO382	WLA761	WLK742
KAH85	KIP33	KOA83	KTF35	WAH508	WAT989	WCU388	WHO592	WLA823	WLK746
KAH87	KIV64	KOJ40	KTG46	WAH509	WAW927	WCU389	WHO872	WLA851	WLK808
KAN25	KIW83	KOJ47	KTR23	WAH510	WAY506	WCW81	WHO873	WLA853	WLK809
KAN32	KIW84	KOJ92	KUQ98	WAH511	WAY558	WCZ39	WHO874	WLA860	WLK947
KAQ88	KIW85	KOJ93	KUS20	WAH512	WBA729	WCZ46	WHO875	WLB347	WLL249
KAY61	KJA22	KOQ80	KUS21	WAH513	WBA759	WDQ38	WHO876	WLB348	WLL321
KBC59	KJA25	KOU43	KUU81	WAH514	WBA760	WDQ42	WHO877	WLB349	WLL395
KBC60	KJK47	KPB65	KUV52	WAH515	WBA810	WDQ45	WHO878	WLB350	WLL396
KBC61	KKB98	KPC65	KUV88	WAH516	WBA812	WDU220	WHO879	WLB351	WLL441
KBC62	KKC98	KPC72	KVH96	WAH517	WBA813	WDU371	WHO880	WLB386	WLL492
KBC88	KKK59	KPC73	KVH97	WAH518	WBA816	WDU407	WHO882	WLB676	WLL493
KBC96	KKL79	KPF69	KVU54	WAH519	WBA822	WDU465	WHO943	WLB727	WLL497
KBD88	KKQ56	KPH82	KVU78	WAH520	WBA823	WDU487	WHO968	WLB913	WLL549
KBE99	KKT85	KPI56	KVU91	WAH521	WBA831	WDU495	WHQ466	WLB917	WLL644
KBI47	KKU71	KPI57	KXQ99	WAH522	WBA832	WED239	WHQ467	WLC210	WLL667
KBI48	KKY45	KPK29	KXR62	WAH523	WBA833	WED277	WHQ468	WLC250	WLL668
KBI91	KKY46	KPK96	KXV78	WAH524	WBA895	WED279	WHQ469	WLC291	WLL669
KBL99	KLA63	KPN72	KYC43	WAH525	WBA899	WEG732	WHQ470	WLC292	WLL670
KBN55	KLD28	KPN85	KYC44	WAH526	WBA900	WEG797	WHQ655	WLC293	WLL671
KBP63	KLD49	KPQ58	KYC45	WAH527	WBA902	WEG889	WHQ778	WLC294	WLL672
KBQ41	KLH75	KPQ59	KYH56	WAH528	WBA907	WEH229	WHQ779	WLC430	WLL691
KBT69	KLH80	KPQ99	KYH64	WAH529	WBA909	WEH286	WHQ780	WLC598	WLL694
KBT70	KLP96	KPR33	KYJ69	WAH530	WBA911	WEH481	WHQ781	WLC618	WLL695
KBT71	KLR21	KPR59	KYN99	WAH531	WBA912	WEH591	WHQ782	WLC621	WLL696
KBT72	KLR38	KPR60	KYO47	WAH532	WBA914	WFY909	WHQ783	WLC653	WLL697
KCL96	KLR51	KPR61	KYO48	WAH533	WBA915	WGF58	WHQ785	WLC950	WLL698
KCM71	KLU31	KPT22	KYP35	WAH534	WBA918	WGF59	WHQ786	WLC951	WLL699
KCM72	KLV62	KPV60	KYS22	WAH535	WBA958	WGH98	WHQ820	WLC952	WLL701
KCM75	KMD35	KPV88	KYW84	WAH536	WBA973	WGI20	WHQ824	WLC953	WLL718
KCO35	KMD36	KPX40	KYW85	WAH537	WBA974	WGV86	WHQ825	WLC954	WLL738
KCS98	KMH63	KPX68	KYW86	WAH538	WBB203	WGW478	WHQ826	WLC955	WLL758
KCX59	KMH76	KPY70	KYZ85	WAH539	WBB205	WGW479	WHR272	WLC956	WLL763
KCX61	KMJ53	KPY73	KZA42	WAH540	WBB221	WGW480	WHR380	WLC957	WLL789
KCX62	KMK67	KPY74	KZA51	WAH557	WBB227	WGW717	WHR385	WLC958	WLL867
KDH79	KML49	KPY90	KZA71	WAH598	WBB228	WGX302	WHR416	WLC961	WLL872
KDT54	KML50	KPZ25	KZA87	WAH623	WBB229	WGZ363	WHS833	WLC964	WLL911
KEA56	KMN21	KPZ82	KZS66	WAH624	WBB352	WHA529	WHS858	WLC965	WLL928
KEO43	KMN57	KQE76	WAA777	WAH628	WBF77	WHA575	WHS921	WLC966	WLM202
KEX58	KMP20	KQG36	WAD26	WAH673	WBO44	WHA576	WHS922	WLC967	WLM213
KFA22	KMP62	KQH32	WAD27	WAP571	WBO45	WHA577	WHT49	WLC968	WLM224
KFA62	KMQ38	KQL44	WAH402	WAP573	WBO48	WHA579	WIA418	WLC969	WLM228
KFA65	KMQ42	KQL45	WAH403	WAP574	WBO58	WHA708	WIA437	WLC970	WLM229
KFA67	KMQ75	KQM44	WAH417	WAS431	WBO59	WHB497	WIQ43	WLC971	WLM234
KFA79	KMQ76	KQM45	WAH420	WAS432	WBP75	WHB505	WIV24	WLC972	WLM235
KFA80	KMR49	KQN52	WAH462	WAS433	WBP76	WHB59	WIV25	WLC973	WLM236
KFA81	KMT32	KQP59	WAH469	WAS434	WCE900	WHC927	WIV56	WLC974	WLM237
KFA84	KMU46	KQP60	WAH472	WAS435	WCF272	WHC935	WJM35	WLC975	WLM238
KFB21	KMV61	KRG32	WAH493	WAS436	WCF964	WHC939	WJM43	WLC976	WLM239
KFB22	KMZ75	KRG78	WAH494	WAS437	WCF965	WHC955	WJM83	WLC977	WLM240
KFJ60	KMZ81	KRV63	WAH495	WAS439	WCF966	WHD256	WJS70	WLC978	WLM241
KGC61	KNA64	KSA42	WAH496	WAS440	WCF996	WHD937	WKS57	WLI81	WLM242
KGC62	KNB40	KSB74	WAH497	WAS441	WCF997	WHD939	WLA271	WLI82	WLM265
KGH98	KND97	KSE30	WAH498	WAS442	WCG242	WHD940	WLA298	WLK464	WLM376
KGO20	KNE78	KSE69	WAH499	WAS443	WCG288	WHE292	WLA299	WLK465	WLM474
KGO30	KNF74	KSE70	WAH500	WAS444	WCG289	WHE293	WLA630	WLK495	WLM479
KGO72	KNI78	KSG74	WAH501	WAS445	WCG291	WHE295	WLA670	WLK496	WLM482
KGP50	KNL31	KSI28	WAH502	WAS446	WCG296	WHF514	WLA672	WLK497	WLM484
KHH65	KNL77	KSO81	WAH503	WAS448	WCG308	WHI894	WLA673	WLK498	WLM486
KHH71	KNL90	KSR59	WAH504	WAS459	WCG309	WHJ474	WLA694	WLK499	WLM487
KHV39	KNM30	KSV63	WAH505	WAS460	WCI63	WHJ684	WLA697	WLK629	WLM518